The invention in which an exclusive right is claimed is defined by the following:

1. An impeller configured to function as a combined fan and impact collector, comprising a base plate and a plurality of vanes disposed on an upper surface of the base plate, such that a ratio of vane height to base plate diameter is in the range of about 0.01 to about 0.2.

2. The impeller of Claim 1, wherein the plurality of vanes are evenly spaced upon the upper surface of the base plate, such that when the impeller is rotated by a prime mover, the impeller presents a balanced load.

3. The impeller of Claim 1, wherein the plurality of vanes are configured to reduce a formation of a vortex when the impeller is disposed within a housing to draw a particulate laden fluid into the housing.

4. The impeller of Claim 3, wherein at least some of the plurality of vanes are truncated vanes.

5. The impeller of Claim 3, wherein none of the vanes are disposed on a portion of the base plate corresponding to an opening in a housing disposed proximate to the impeller.

6. The impeller of Claim 1, wherein a base of each of the plurality of vanes extends laterally to a greater extent than does an upper surface of the vane.

7. The impeller of Claim 1, wherein each of the plurality of vanes is taller toward a center of the base plate, and shorter toward an outer edge of the base plate.

8. The impeller of Claim 1, wherein each of the plurality of vanes does not extend closer than about 1 mm toward an outer edge of the base plate.

9. An impact particle collector for separating particulates from a gaseous fluid in which the particulates are entrained, comprising:

(a) a prime mover having a drive shaft that is drivingly rotated;

(b) an impeller that is mechanically coupled to the drive shaft and rotated thereby, the impeller comprising a base plate and a plurality of vanes disposed on an upper surface of the base plate, such that a ratio of vane height to base plate diameter is in the range of about 0.01 to about 0.2; and

(c) a housing for the impeller, said housing defining a fluid passage for conveying the gaseous fluid in which the particulates are entrained to the impeller, such that when the impeller is rotated by the prime mover, the gaseous fluid is drawn into the housing so that the particulates entrained in the gaseous fluid impact upon the impeller, being thereby separated from the gaseous fluid when impacted by the vanes of the impeller.

10. The impact particle collector of Claim 9, wherein the plurality of vanes are configured to include an enlarged base to facilitate injection molding.

11. The impact particle collector of Claim 9, wherein the plurality of vanes are configured such that a height of each vane adjacent a center of the base plate is larger than a height of each vane adjacent to an outer edge of the base plate.

12. The impact particle collector of Claim 9, wherein the plurality of vanes are configured such that each vane does not extend within about one millimeter of an outer edge of the base plate.

13. The impact particle collector of Claim 9, wherein the plurality of vanes are configured to reduce a formation of a vortex within the housing.

14. The impact particle collector of Claim 13, wherein at least some of the plurality of vanes are truncated vanes.

15. The impact particle collector of Claim 13, wherein the housing includes an opening disposed proximate a center of the base plate, and none of the vanes are disposed on a portion of the base plate directly beneath the opening.

16. The impact particle collector of Claim 9, further comprising a nozzle in fluid communication with a rinse fluid reservoir, the nozzle being disposed to introduce a rinse fluid at the inward edges of the plurality of vanes, when the impeller is being rotated by the prime mover.

17. The impact particle collector of Claim 9, further comprising:

(a) a rinse fluid reservoir including a sensor configured to detect a level of rinse fluid contained within the reservoir;

(b) a nozzle in fluid communication with the rinse fluid reservoir, the nozzle being disposed to introduce a rinse fluid into the housing to rinse particulates off of the impeller; and

(c) a pump configured to deliver a rinse fluid from the rinse fluid reservoir to the nozzle.

18. The impact particle collector of Claim 14, further comprising a microcontroller electrically coupled with the sensor, and controllably coupled to the prime mover and the pump, the microcontroller being configured to implement a plurality of functions, including at least one of:

(a) reducing a rotational velocity of the impeller whenever a level of rinse fluid in the rinse fluid reservoir falls below a predetermined level;

(b) reducing a volume of fluid delivered from the rinse fluid reservoir to the nozzle per unit time, whenever a level of rinse fluid in the rinse fluid reservoir falls below a predetermined level; and

(c) de-energizing the prime mover whenever a level of rinse fluid in the rinse fluid reservoir falls below a predetermined level.

19. The impact particle collector of Claim 18, further comprising a makeup reservoir in fluid communication with the rinse fluid reservoir, the makeup reservoir providing additional rinse fluid to the rinse fluid reservoir

should level of rinse fluid in the rinse fluid reservoir falls below a predetermined level.

20. The impact particle collector of Claim 18, wherein the rinse fluid reservoir is coupled in fluid communication with a lower portion of the housing, and said lower portion of the housing includes sloping surfaces configured to direct rinse fluid contacting the lower portion of the housing into the rinse fluid reservoir.

21. The impact particle collector of Claim 9, further comprising a filter configured to filter the gaseous fluid before the gaseous fluid contacts the impeller.

22. The impact particle collector of Claim 21, wherein the filter comprises a size-exclusion membrane including pores of a predetermined certain size, such that particles larger than the pores cannot pass through the membrane.

23. The impact particle collector of Claim 21, wherein the filter comprises a magnetic membrane including pores of a predetermined certain size, such that nonmagnetic particles larger than the pores cannot pass through the membrane, and magnetic particles smaller than the pores cannot pass through the membrane.

24. The impact particle collector of Claim 21, wherein the filter comprises an affinity-based membrane including pores of a predetermined certain size, such that particles larger than the pores cannot pass through the membrane, and particles smaller than the pores and having a corresponding affinity cannot pass through the membrane.

25. The impact particle collector of Claim 24, wherein the affinity-based membrane comprises an antibody coating, such that particles having a corresponding antigen cannot pass through the membrane.

26. The impact particle collector of Claim 21, wherein the filter comprises a membrane including pores of a predetermined certain size, and a incorporating a chemical adsorbent, such that particles larger than the pores cannot pass through the membrane, and chemicals absorbed by the chemical adsorbent cannot pass through the membrane.

27. The impact particle collector of Claim 9, wherein the impeller has a mean surface roughness selected to increase the likelihood that a particle entrained in the gaseous fluid will adhere to the impeller.

28. The impact particle collector of Claim 9, wherein the internal surfaces of the housing each have a mean surface roughness selected to decrease the likelihood that a particle entrained in the gaseous fluid will adhere to the internal surfaces of the housing.

29. The impact particle collector of Claim 9, wherein the housing comprises curved internal surfaces wherever a side of the housing joins an upper portion of the housing, and wherever a side of the housing joins a lower portion of the housing, such curved internal surfaces reducing the likelihood that a rinse fluid will be undesirably retained within the housing.

30. The impact particle collector of Claim 9, wherein an upper portion of the housing comprises an opening for directing a gaseous fluid toward the impeller, and an external surface of the upper portion of the housing is shaped as an inverted cone, with a base of the cone corresponding to an outer edge of the upper portion, and an apex of the cone corresponding to the opening, such that the apex of the cone is disposed lower than the base of the cone.

31. The impact particle collector of Claim 9, wherein an upper portion of the housing comprises an opening for directing a gaseous fluid toward the impeller, and an internal surface of the upper portion of the housing is shaped as an inverted cone, with a base of the cone corresponding to an inner edge of the

upper portion, and an apex of the cone corresponding to the opening, such that the apex of the cone is disposed higher than the base of the cone.

32. The impact particle collector of Claim 9, wherein an upper portion of the housing comprises an opening for directing a gaseous fluid toward the impeller, and an external surface of the upper portion of the housing slopes away from the opening, such that a highest portion of the external surface of the upper portion of the housing corresponds to an outer edge of the upper portion, and a lowest portion of the external surface of the upper portion of the housing corresponds to a periphery of the opening.

33. The impact particle collector of Claim 9, wherein an upper portion of the housing comprises an opening for directing a gaseous fluid toward the impeller, and an internal surface of the upper portion of the housing slopes away from the opening, such that a lowest portion of the internal surface of the upper portion of the housing corresponds to an inner edge of the upper portion, and a highest portion of the internal surface of the upper portion of the housing corresponds to a periphery of the opening.

34. The impact particle collector of Claim 33, wherein each of the plurality of vanes includes a sloping upper surface substantially corresponding to the slope of the internal surface of the upper portion of the housing, such that a height of each vane is greater proximate a center of the base plate that a height of each vane proximate an outer edge of the base plate.

35. The impact particle collector of Claim 33, wherein the impeller further comprises a top plate having an opening in a center of the top plate, the top plate having sloping upper surfaces and lower surfaces that substantially correspond to the slope of the internal surface of the upper portion of the housing, such that a lowest portion of the top plate corresponds to an outer edge of the top plate, and a highest portion of the top plate corresponds to an inner edge of the top plate proximate the opening in the top plate.

36. The impact particle collector of Claim 9, wherein a gap exists between an inner surface of an upper portion of the housing and the impeller, such that the gap is designed to exceed an expected dimensional variation related to a manufacturing process used to produce the impeller.

37. The impact particle collector of Claim 36, wherein the gap is about 2 millimeters.

38. The impact particle collector of Claim 36, wherein the gap is about 2.2 millimeters.

39. A method for making an impact particle collector, comprising the steps of:

(a) designing a housing and an impeller, the housing defining a fluid passage for conveying the gaseous fluid in which particulates are entrained to the impeller, such that when the impeller is rotated by a prime mover, the gaseous fluid is drawn into the housing so that the particulates entrained in the gaseous fluid impact upon the impeller, being thereby separated from the gaseous fluid when impacted by the vanes of the impeller;

(b) selecting a fabrication process to be used to produce the impeller;

(c) determining a dimensional variation associated with the fabrication process selected;

(d) evaluating the design to ensure that a designed gap between the housing and the impeller exceeds the dimensional variation associated with the fabrication process selected;

(e) fabricating the housing and the impeller; and

(f) assembling the impact particle collector.

40. The method of Claim 39, wherein the step of designing the impeller comprises the step of ensuring that a ratio of vane height to base plate diameter in the impeller is in the range of about 0.01 to about 0.2.

41. The method of Claim 39, wherein the step of designing the impeller comprises the step of, ensuring that the impeller vanes are evenly spaced upon the upper surface of the base plate of the impeller, such that when the impeller is rotated by a prime mover, the impeller presents a balanced load.

42. The method of Claim 39, wherein the step of designing the impeller comprises the step of ensuring that the impeller vanes are configured to reduce a formation of a vortex when a particulate laden fluid is drawn into the housing.

43. The method of Claim 42, wherein the step of ensuring that the impeller vanes are configured to reduce a formation of a vortex comprises the step of ensuring at least some of the vanes are truncated vanes.

44. The method of Claim 42, wherein the step of ensuring that the impeller vanes are configured to reduce a formation of a vortex comprises the step of ensuring the vanes are not disposed on a portion of the base plate immediately adjacent to an opening in the housing.

45. The method of Claim 39, wherein the step of designing the impeller comprises the step of ensuring a base of each vane extends laterally to a greater extent than does an upper surface of the vane.

46. The method of Claim 39, wherein the step of designing the impeller comprises the step of ensuring each vane is taller toward a center of the base plate, and shorter toward an outer edge of the base plate.

47. The method of Claim 39, wherein the step of designing the impeller comprises the step of ensuring each vane does not extend closer than about 1 mm toward an outer edge of the base plate.

48. The method of Claim 39, wherein the step of designing the impeller comprises the step of ensuring the impeller has a mean surface roughness

selected to increase the likelihood that a particle entrained in the gaseous fluid will adhere to the impeller.

49. The method of Claim 39, wherein the step of designing the housing comprises the step of ensuring the internal surfaces of the housing each have a mean surface roughness selected to decrease the likelihood that a particle entrained in the gaseous fluid will adhere to the internal surfaces of the housing.

50. The method of Claim 39, wherein the step of designing the housing comprises the step of ensuring a lower portion of the housing includes sloping surfaces configured to direct rinse fluid contacting the lower portion of the housing into a rinse fluid reservoir.

51. The method of Claim 39, wherein the step of designing the housing comprises the step of ensuring the housing includes a filter configured to filter the gaseous fluid before the gaseous fluid contacts the impeller.

52. The method of Claim 39, wherein the step of designing the housing comprises the step of ensuring the housing includes curved internal surfaces wherever a side of the housing joins an upper portion of the housing, and wherever a side of the housing joins a lower portion of the housing, such curved internal surfaces reducing the likelihood that a rinse fluid will be undesirably retained within the housing.

53. The method of Claim 39, wherein the step of designing the housing comprises the step of ensuring the housing includes a nozzle disposed to direct a rinse fluid toward the inward edges of the vanes, when the impeller is being rotated by a prime mover.

54. The method of Claim 39, wherein the step of designing the housing comprises the step of ensuring an upper portion of the housing comprises an opening for directing a gaseous fluid toward the impeller, and an internal surface of the upper portion of the housing slopes away from the opening, such that a lowest portion of the internal surface of the upper portion of the housing corresponds to an inner edge of the upper portion, and a highest portion of the

internal surface of the upper portion of the housing corresponds to a periphery of the opening.

55. The method of Claim 54, wherein the step of designing the impeller comprises the step of ensuring the impeller vanes include sloping upper surfaces substantially corresponding to the slope of the internal surface of the upper portion of the housing, such that a height of each vane is greater proximate a center of the base plate that a height of each vane proximate an outer edge of the base plate.